AUSTRALIAN VETERINARY EMERGENCY PLAN

AUSVETPLAN

Response strategy

Rinderpest

Version 5.0

AUSVETPLAN is a series of technical response plans that describe the proposed Australian approach to an emergency animal disease incident. The documents provide guidance based on sound analysis, linking policy, strategies, implementation, coordination and emergency-management plans.

National Biosecurity Committee

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In this manual, text placed in square brackets [xxx] indicates that that aspect of the manual remains unresolved or is under development; such text is not part of the official manual. The issues will be further worked on by experts and relevant text included at a future date.

Contact information

If you have any requests or inquiries concerning reproduction and rights, or suggestions or recommendations, you should address these to:

AUSVETPLAN – Animal Health Australia
Executive Manager, Emergency Preparedness and Response
PO Box 5116
Braddon ACT 2612
Tel: 02 6232 5522
email: aha@animalhealthaustralia.com.au

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DISEASE WATCH HOTLINE: 1800 675 888

The Disease Watch Hotline is a toll-free telephone number that connects callers to the relevant state or territory officer to report concerns about any potential emergency disease situation. Anyone suspecting an emergency disease outbreak should use this number to get immediate advice and assistance.

Edition 1
1991

Edition 2
Version 2.0, 1996 (major update)

Edition 3
Version 3.0, 2009 (major update to Edition 3)

Edition 5
Version 5.0, 2020 (not a full update, incorporation into new format)

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1 Introduction

1.1 This manual

1.1.1 Purpose

This response strategy outlines the nationally agreed approach for the response to an incident – or suspected incident – of rinderpest in Australia. It has been developed to guide decision making and so support the implementation of an efficient, effective and coherent response.

1.1.2 Scope

This response strategy covers rinderpest caused by rinderpest virus.

This response strategy provides information about:

- the disease (Section 2)
- the implications for Australia, including potential pathways of introduction, social and economic effects, and the critical factors for a response to the disease (Section 3)
- the agreed policy and guidelines for agencies and organisations involved in a response to an outbreak (Section 4)
- declared areas and premises (Section 5)
- quarantine and movement controls (Section 6)
- surveillance and establishing proof of freedom (Section 7).

The key features of rinderpest are described in the **Rinderpest Fact Sheet** (Appendix 1).

1.1.3 Development

The strategies in this document for the diagnosis and management of an outbreak of rinderpest are based on risk assessment. They are informed by the recommendations in the World Organisation for Animal Health (OIE) *Terrestrial animal health code* (Chapter 8.16) and the OIE *Manual of diagnostic tests and vaccines for terrestrial animals* (Chapter 3.1.19). The strategies and policy guidelines are for emergency situations and are not applicable to policies for imported animals or animal products.

This manual has been produced in accordance with the procedures described in the **AUSVETPLAN *Overview***, and in consultation with Australian national, state and territory governments; the relevant livestock industries; nongovernment agencies; and public health authorities, where relevant.

In this manual, text placed in square brackets [xxx] indicates that that aspect of the manual remains unresolved or is under development; such text is not part of the official manual. The issues will be worked on by experts and relevant text included at a future date.

1.2 Other documentation

This response strategy should be read and implemented in conjunction with:

- other AUSVETPLAN documents, including the operational, enterprise and management manuals; and any relevant guidance and resource documents. The complete series of manuals is available on the Animal Health Australia website[1]
- relevant nationally agreed standard operating procedures (NASOPs).[2] These procedures complement AUSVETPLAN and describe in detail specific actions undertaken during a response to an incident. NASOPs have been developed for use by jurisdictions during responses to emergency animal disease (EAD) incidents and emergencies
- relevant jurisdictional or industry policies, response plans, standard operating procedures and work instructions
- relevant Commonwealth and jurisdictional legislation and legal agreements (such as the Emergency Animal Disease Response Agreement – EADRA[3]), where applicable.

1.3 Training resources

EAD preparedness and response arrangements in Australia

The EAD Foundation Online course[4] provides livestock producers, veterinarians, veterinary students, government personnel and emergency workers with foundation knowledge for further training in EAD preparedness and response in Australia.

[1] www.animalhealthaustralia.com.au/our-publications/ausvetplan-manuals-and-documents
[2] www.animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/nationally-agreed-standard-operating-procedures
[3] https://animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/ead-response-agreement
[4] www.animalhealthaustralia.com.au/emergency-animal-disease-training-program

2 Nature of the disease

Rinderpest (cattle plague) was a peracute to acute, usually fatal, viral disease, principally of cattle and buffalo; a subacute or mild form of the disease was seen in populations in which the disease was endemic. It spreads mainly via aerosols between animals in direct contact. An outbreak of the classical disease would be characterised by sudden-onset fever, and inflammation and necrosis of the mucous membranes, manifested by erosive stomatitis, gastroenteritis and dehydration. Dysentery is a common feature of the disease, accompanied by rapid respiration and discharge from the nose and eyes. Mortality may approach 90%.

2.1 Aetiology

Rinderpest virus is a member of the genus *Morbillivirus* of the family *Paramyxoviridae*. Viruses in the same genus include the causative agents of peste des petits ruminants (PPR), canine distemper and human measles.

There is only one serotype of rinderpest virus, but strains vary in virulence. Three genetically distinct lineages were recognised as causing disease in Ethiopia and Sudan, east Africa, and Asia, respectively. The disease has now been eradicated worldwide.

2.2 Susceptible species

Cattle and buffalo

Cattle and buffalo are highly susceptible to rinderpest.

Bos indicus (zebu) breeds of cattle have more resistance than *B. taurus* (European) breeds.

Spread of the disease is reduced by the presence of more resistant breeds of cattle and immunity in previously infected animals. In these situations, it is usually young animals that are infected.

Sheep and goats

There are many reports of sheep and goats in close contact with infected cattle becoming infected and developing clinical signs (Narayanaswamy & Ramani 1973, Ramani et al 1974). However, serious clinical rinderpest in sheep and goats is uncommon. The more likely outcome of infection is seroconversion, with subclinical or inapparent infection that is not readily transmitted back to cattle (El Hag Ali 1973, Wafula & Kariuki 1987, Anderson et al 1990ab).

In east Africa, the virus has been known to infect sheep without spreading to goats, and goats without apparently involving sheep (Plowright 1968). Rinderpest is unlikely to occur in sheep and goats without simultaneous involvement of bovines.

Other animals

Inapparent infection develops in camels but is not transmitted to other animals.

The susceptibility to infection of farmed and feral deer species in Australia is unknown, but it is assumed that they can become infected and transmit the disease.

European pigs can be infected but rarely develop serious disease. Asian pigs are more susceptible and can transmit the disease back to cattle (Ramani et al 1974). Feral pigs in Australia are predominantly of European origin.

Infection of pigs is predominantly by contact with infected animals. The ingestion of meat from infected animals may act as a less common source of infection (Geering et al 1995).

Native animals

No disease developed in two kangaroos and two possums inoculated or drenched with infected blood (Robertson 1924).

As rinderpest is restricted to ruminants and pigs in other countries, there is no reason to suspect that the disease would establish itself in populations of Australian native animals. The disease in wildlife (giraffe, eland and kudu) in Africa is not maintained without simultaneous disease in cattle.

2.2.1 Zoonotic potential

Rinderpest does not affect humans.

2.3 World distribution

For the latest information on the distribution of rinderpest, refer to the World Organisation for Animal Health (OIE) World Animal Health Information Database.[5]

2.3.1 Distribution outside Australia

Rinderpest originated around the Caspian Basin many centuries ago, and spread with marauding armies throughout Europe and Asia, causing death and devastation. It was introduced into the Horn of Africa in 1889. In the 7 years to 1896, a pandemic spread throughout Africa, killing 90% of the cloven-hoofed animals in its path. This was the most devastating visitation of a disease on an animal population.

On 14 October 2010, the FAO announced that field activities over previous decades and the worldwide campaign to eradicate rinderpest were coming to an end.[6] In June 2011, the FAO confirmed that rinderpest had been eradicated from the world, making it only the second disease in history to be fully eradicated (outside of laboratory stocks), following smallpox.[7]

For the latest information on the distribution of rinderpest, refer to the website of the OIE World Animal Health Information Database (WAHID).[8]

[5] www.oie.int/animal-health-in-the-world/the-world-animal-health-information-system/the-oie-data-system
[6] www.bbc.co.uk/news/science-environment-11542653
[7] www.nytimes.com/2011/06/28/health/28rinderpest.html?pagewanted=all
[8] www.oie.int/animal-health-in-the-world/the-world-animal-health-information-system/data-after-2004-wahis-interface/

2.3.2 Occurrence in Australia

Rinderpest was introduced into Australia in 1923 in cattle on a ship also containing Asian pigs. However, it was quickly eradicated (Weston 1924).

2.4 Epidemiology

2.4.1 Incubation period

The incubation period in susceptible animals may be as short as 2–3 days (Nawathe & Lamorde 1983) and ranges up to 15 days (Scott 1981). Rinderpest virus may appear in the blood, excretions and secretions 1–2 days before the appearance of clinical signs. The maximum excretion of virus occurs 3–7 days after signs have developed.

The strain of the virus, dosage and route of exposure may influence the course of the disease, so that a period of 8–15 days may pass before clinical signs are seen in in-contact animals. The rapidity of within-herd spread following introduction is an inconsistent diagnostic feature. However, most cattle in infected herds become infected within 3–4 weeks of introduction of the virus into the herd.

OIE incubation period

For the purposes of the OIE *Terrestrial animal health code*, the incubation period for rinderpest is 21 days.

2.4.2 Persistence of agent and modes of transmission

General properties

Rinderpest virus has a lipid envelope, and strains vary in their pH stability. At 4 °C, rinderpest virus is most stable at pH 7.2–7.9, with a half-life of 3.7 days (Plowright 1968). The virus is inactivated at pH values of less than 5.6 or more than 9.6 (Geering et al 1995).

These features ensure a high degree of susceptibility to all disinfectants. In general, alkalis (sodium carbonate, sodium hydroxide), halogens (chlorine) and phenolic compounds are good for disinfecting buildings, wooden structures, concrete surfaces, equipment and vehicles. For personal disinfection, citric acid, alcohols and iodophors are suitable. Further information, including dilution rates and trade names, is available in the **AUSVETPLAN operational manual *Decontamination***.

Environment (including windborne spread)

Rinderpest virus may survive in culture for at least 4 months at –20 °C, 8 weeks at 4 °C, 1 week at 20–25 °C and more than 2.6 days at 37 °C (Plowright 1968). The half-life of the virus in cattle blood, spleen or lymph node at 56 °C is 5 minutes. The virus is inactivated at temperatures above 70 °C (De Boer & Barber 1964).

The virus is rapidly inactivated at environmental temperatures by ultraviolet light and desiccation, as follows:

- Contaminated enclosures devoid of vegetation may be infective for cattle for a maximum of 48 hours after the removal of infected animals.
- Contaminated buildings without ventilation or sunlight may remain infective for 48–96 hours.
- Contaminated pasture may remain infective for only 6–8 hours if unshaded and for 18–24 hours if shaded (Plowright 1968).

Transmission is mainly by aerosol over a short distance (up to 2 metres), where the animals are in contact for several hours outdoors or for 15 minutes indoors. However, spread of the virus over several hundred metres is possible at normal wind velocities (Scott & Provost 1992). Airborne spread is most likely to occur at night when the effects of sunlight and temperature are lowest (Scott & Provost 1992). High and low humidity aid the survival of the airborne virus, which is rapidly destroyed when the relative humidity is 50–60% (Hyslop 1979, cited in Scott 1985).

Live animals

Rinderpest is usually transmitted by contact with secretions and excretions from infected animals (particularly nasal discharges). Virus is found in expired air, nasal and eye discharges, peri-parturient vaginal discharges, saliva, faeces, semen and urine, and may be present in milk. Contact transmission is unlikely in the first 24 hours of the fever or more than 24 hours after the disappearance of fever.

The route of entry is the upper or lower respiratory tract, with nasal epithelium being the usual site of the first infection. The first significant virus multiplication probably occurs in tonsils and lymph nodes draining the respiratory tract. Viraemia occurs, and widespread viral distribution throughout the body follows.

Cattle can be infected experimentally by any route of inoculation. Infection occurs readily after conjunctival or nasal instillation of nasal discharges. The virus cannot pass through intact skin.

Recovered animals carry the virus for no longer than 7 weeks (see reference to milk, below), and develop solid immunity and a high antibody titre (Nawathe & Lamorde 1983). There is no known chronic carrier state in recovered animals. However, animals other than cattle (ie sheep, goats, camels, wild African ruminants, pigs) can all be subclinically infected and may act as inapparent carriers.

Pregnant animals may abort 2–12 weeks after recovery, and fetal discharges may contain infectious virus (Plowright 1968). The aborting cows are not viraemic, and their sera contain high levels of antibodies (Scott & Provost 1992). Vaginal discharges from cows that abort have been found to be infectious for up to 12 weeks after abortion (Plowright 1968), but Wafula et al (1989) reported no virus in vaginal discharges later than 24 hours after abortion (see below).

Infection spreads to new areas by the movement of infected animals. Transmission between herds is principally by movement of cattle, although transmission via contaminated water, equipment and clothing is also possible (see below).

Animal products

Rinderpest virus is rapidly inactivated by autolysis and putrefaction, and so will not survive more than 24 hours in the carcass of an animal that has died from the disease (Plowright 1968, Nawathe & Lamorde 1983).

The pH of bovine muscle falls from about 7.2 at death to between 5.5 and 5.8 about 6 hours later. Since rinderpest virus is sensitive to low pH, it is likely to be inactivated in hung beef but not necessarily in the meat of other animals. Ezzat et al (1970) recorded that infected meat kept refrigerated for 7 days was still infective to cattle.

Virus may be present in milk from 1–2 days before clinical signs develop and, exceptionally, has been recorded up to 45 days after clinical recovery. Although the virus is rapidly inactivated at temperatures above 70 °C, there is no confirmation that it is inactivated by pasteurisation of milk. Heat drying of milk for inclusion in milk powder should inactivate the virus.

Meat, meat products and casings, including use as animal feed

Salted or frozen meat is unlikely to be important in the transmission of disease.

The virus can remain viable for long periods in chilled and frozen tissues.

Ingestion of food contaminated with secretions from infected animals, or ingestion of infected meat, may be a source of infection in pigs (via the gastrointestinal route), and hence of transmission back to cattle.

Animal byproducts

Hides, skin, wool and other fibres

It is unlikely that any virus on wool or fibre would remain infective and spread disease.

Semen and embryos from live susceptible animals

The virus is present in all secretions, and semen transmission was demonstrated by very early work.

For in vivo–derived embryo transfer in cattle, rinderpest has been assessed as a Category 3 disease by the International Embryo Technology Society (IETS). As such, preliminary evidence indicates that the risk of transmission is negligible, provided that the embryos are properly handled between collection and transfer (according to the IETS Manual 1998, updated in 2004). However, additional in vitro and in vivo experimental data are required to substantiate the preliminary findings.

See the **AUSVETPLAN enterprise manual *Artificial breeding centres*** for further information.

Equipment, including personal items

Rinderpest virus survives poorly outside the host and does not persist in the environment. Indirect transmission of virus, by clothing or equipment contaminated with faeces or other excretions from infected cattle, is therefore unlikely.

Arthropod vectors

The virus has been isolated from a number of insects, but they are not considered important factors in transmission.

2.5 Diagnostic criteria

Rinderpest should be suspected when acute fever with diarrhoea in cattle or buffalo is accompanied by erosions of the mouth linings and high mortality. Rapid spread from animal to animal and herd to herd can occur, with animals of all ages becoming sick and dying. Any disease outbreak with these features is highly suggestive of rinderpest.

2.5.1 Clinical signs

Animals

Cattle

In the peracute form, seen in highly susceptible and young animals, the typical signs are high fever, congested mucous membranes, and death within 2–3 days.

Acute cases are characterised by the sudden onset of a rapidly mounting fever, which reaches 40–42 °C by the second or third day after onset and remains high for the next 3–5 days.

Early in the fever, individuals may show depression, loss of appetite, congestion of the visible mucous membranes, watery discharges from the eyes and nose, drying of the muzzle, constipation, harshness of the hair coat and, in the case of dairy animals, loss of milk production. None of these symptoms permits a diagnosis of rinderpest.

From the second or third day of fever, shallow necrotic erosions appear on the lower lip and gums and, increasing in extent and severity, become the dominant feature for the remainder of the fever. Ultimately, these lesions, which are characteristic of rinderpest, may be found on the underside of the free portion of the tongue, on the floor of the mouth, on and between the buccal papillae, on the margin between the upper lip and dental pad, and on and between the ridges of the hard palate. Erosions may also be noticed on the lining of the front of the nose and on the vulva and vagina. Eye and nasal discharges become profuse and assume a mucopurulent character, and the animal's breath becomes strongly fetid.

Profuse diarrhoea usually commences 2 or 3 days after the onset of mouth lesions. Watery at first, it later contains mucus, blood and fragments of necrotic epithelium. It results in dehydration, weakness and prostration in animals not succumbing in the early stages of the disease. Most animals die 8–12 days after the onset of clinical signs, but some animals recover after a period of diarrhoea lasting 4–5 days.

In previous endemic areas in Africa, the subacute form of rinderpest manifest as a mild, nonfatal infectious disease of cattle, but could undergo virulence modulations to the classic form.

When the virus is introduced into a large and fully susceptible bovine population, it is probable that some or all of the manifestations of classic rinderpest will be seen. For example, the mortality rate, which may vary initially between 30% and 90%, may increase with repeated transmissions of the virus because of increasing virulence on passage of the virus. Under these circumstances, it is even possible that peracute cases will occur. However, the fever might be brief and accompanied by the transient appearance of mouth lesions, and a short and light bout of diarrhoea. In such cases, it would be difficult to make a diagnosis based entirely on clinical appearance.

Sheep and goats

Sheep and goats can be affected and develop clinical signs. Narayanaswamy and Ramani (1973) reported great variation in the clinical picture of rinderpest in sheep. Recent opinion suggests that the signs in sheep and goats may be caused by PPR.

In the clinical form, a high fever (41–42 °C) lasts 3–4 days. Pinpoint discrete or coalescent erosions emerge on the lining of the mouth, and are prominent on the gums and lips. There is concomitant mucopurulent nasal discharge, conjunctivitis and respiratory distress. Diarrhoea, loss of appetite and laboured breathing also occur. Lambs and kids suffer more severely than adults, and total mortalities range from 70% to 90%. Death generally occurs 3–7 days after the onset of fever.

Buffalo

The clinical signs in buffalo are assumed to be similar to those in cattle.

Pigs

In European pigs, usually only mild symptoms develop, with transient fever.

Asian pigs may develop the classical clinical symptoms seen in cattle and suffer high mortality (Ramani et al 1974).

Humans

Rinderpest does not affect humans.

2.5.2 Pathology

Gross lesions

Postmortem findings include a dehydrated carcass; fluid faeces, containing blood, and faecal staining of the legs; erosions of the mucosa in the mouth, pharynx and oesophagus; congestion, oedema and erosion of the abomasal mucosa; prominent necrotic Peyer's patches; and congestion and erosion of the mucosa of the large intestine, especially along the longitudinal folds, giving a 'tiger (or zebra) striping' appearance.

Microscopic lesions

Histopathology findings are characterised by lymphocyte and epithelial necrosis, and by the formation of multinucleated giant cells containing intracytoplasmic and intranuclear inclusions in the germinal centres in lymphatic tissues and in stratified squamous epithelial cells.

2.5.3 Differential diagnosis

The following diseases should be considered in a differential diagnosis of rinderpest in cattle:

- foot-and-mouth disease
- malignant catarrhal fever
- bovine virus diarrhoea
- infectious bovine rhinotracheitis.

Rinderpest is distinguished by the characteristic nonvesicular lesions not involving the feet, high morbidity, and mortality approaching 100%. The other diseases rarely involve both high morbidity and high mortality.

In sheep and goats, the major disease considered in a differential diagnosis would be PPR. As the GREP nears completion, rinderpest signs in small ruminants in rinderpest-free countries will be more likely to be due to PPR (OIE *Manual of diagnostic tests and vaccines for terrestrial animals*).[9]

2.5.4 Laboratory tests

Samples required

Rinderpest virus is most easily isolated during the early, acute stage of the disease when clinical signs are still apparent. The specimens that should be collected from the live animal include blood (whole EDTA, and clotted), lymph node fluid or biopsy, necrotic material from oral lesions, and lachrymal fluid. Specimens for virus isolation are best taken from animals with a high temperature and before diarrhoea has started (eg from the early, less obvious cases).

At postmortem, fresh samples of spleen, lymph nodes and affected sections of alimentary tract mucosa should be collected for virus isolation. Samples of tonsil, tongue, spleen, lymph nodes and affected parts of the alimentary tract should be collected for histopathology. Postmortem samples should be collected only from animals slaughtered for the purpose or very fresh carcasses.

Transport of specimens

Specimens should be submitted in accordance with agreed state or territory protocols. Specimens should initially be forwarded to the state or territory laboratory for appropriate analysis, and assessment of whether further analysis will be required by the CSIRO Australian Centre for Disease Preparedness (CSIRO-ACDP), Geelong.

If the state or territory laboratory deems it necessary, duplicate samples of the specimens should be forwarded to CSIRO-ACDP for emergency disease testing, after the necessary clearance has been obtained from the chief veterinary officer (CVO) of the state or territory of the suspect case, and after the CVOs of Victoria and Australia have been informed about the case and the transport of the specimens to Geelong (for the first case). Sample packaging and consignment for delivery to CSIRO-ACDP should be coordinated by the relevant state or territory laboratory.

For further information, see the **AUSVETPLAN management manual *Laboratory preparedness***.

Packing specimens for transport

All unpreserved tissue samples, swab and biopsy material, and whole blood should be chilled and forwarded with water ice or frozen gel packs. If the journey is expected to last more than 72 hours, the samples should be frozen and forwarded packed in dry ice. For further information, see the **AUSVETPLAN management manual *Laboratory preparedness***.

[9] www.oie.int/en/standard-setting/terrestrial-manual/access-online

2.5.5 Laboratory diagnosis

CSIRO-ACDP tests

Tests currently available at CSIRO-ACDP are shown in Table 2.1.

Table 2.1 Laboratory tests currently available at CSIRO-ACDP for diagnosis of rinderpest

Test	Specimen required	Test detects	Time taken to obtain result
Virus isolation	Tissue/whole EDTA blood	Virus	5–7 days
Serum neutralisation	Serum	Antibody	6–7 days
Histopathology	Tissue samples	Microscopic changes	2 days
Animal inoculation	Virus isolate	Host range	10 days
Electron microscopy	Tissue samples	Virus	1 day

Note: CSIRO-ACDP now has a PCR test available and can obtain an ELISA test.
Source: Information provided by the then CSIRO-AAHL, 1995 (refer to CSIRO-ACDP for most up-to-date information).

Other tests

Other tests not currently available in Australia include an immunocapture enzyme-linked immunosorbent assay (ELISA) specific for rinderpest antigen, and differential immunohistochemical staining that differentiates PPR from rinderpest. Cross-virus serum neutralisation tests or the competitive ELISA using monoclonal antibodies will distinguish rinderpest antibodies from PPR antibodies (Anderson et al 1991). However, since it is unlikely that both diseases would occur in Australia at the same time, either a serum neutralisation test using rinderpest antigen or the indirect ELISA would be the test of choice.

2.6 Resistance and immunity

Susceptible cattle of all ages, sexes and breeds can be infected with rinderpest virus and develop serious clinical disease. In countries free from rinderpest, its introduction is dreaded because it is believed that the disease would spread rapidly in such susceptible populations and mortality would be high. This may not always be so, however, because of variations in the pathogenicity of virus strains and differences in susceptibility among breeds of cattle.

Innate immunity

Because the disease has been widespread in Asia and Africa, all breeds of cattle must be considered to be susceptible. In general, zebu breeds (*Bos indicus*) have more resistance than European breeds (*B. taurus*). European breeds have been seriously affected in outbreaks that were relatively mild in native African cattle (although not all African cattle are zebu breeds).

Australia's cattle population has a significant proportion of zebu-type animals. If the disease first occurred in such animals, the classic expression of disease may therefore be muted.

Calves suckling immune cows in the first 12–34 hours after birth acquire passive immunity, which is protective for 4–9 months.

Acquired immunity

Antibodies appear around the sixth day of the disease, and recovered cattle are solidly immune and resistant to reinfection for life.

All rinderpest virus strains are immunologically the same.

2.7 Vaccination

Attenuated ('live') vaccines have been used in the control of rinderpest. An example is the tissue culture rinderpest vaccine (TCRV) – RBOK strain. This vaccine is safe to use in all animals and provides protection for at least 11 years. Unfortunately, serological differentiation between vaccinated animals and field-infected animals is difficult. As the GREP nears completion, the problems posed by TCRV interfering with serosurveillance of field infection have resulted in a virtual halt in TCRV production. The development of marker attenuated vaccines is an urgent requirement.

In calves, since passive immunity derived from maternal antibodies in the colostrum provides protection against infection for 4–9 months, vaccination of calves less than 9 months old may not be effective in producing immunity.

2.8 Treatment of infected animals

There is no treatment for rinderpest.

3 Implications for Australia

3.1 Potential pathways of introduction

Rinderpest could be introduced to Australia only through accidental or malicious release of rinderpest virus from a laboratory.

3.2 Social and economic effects

An uncontrolled outbreak of rinderpest in Africa from 1889 to 1896 killed 90% of ruminants in its path as it spread from the Horn of Africa to South Africa. A similar result could be expected in an uncontrolled outbreak in Australia, which might reasonably be expected to cause very high mortality in infected herds. It is possible, however, that the outbreak may be characterised by subacute clinical signs.

If the disease can quickly be brought under control, there may be negligible disruption to the community. In a large-scale outbreak, which might take several weeks to control, there would be severe, widespread losses in the cattle industry, and possibly in the pig, sheep and goat industries. The resulting financial losses at the local level and from loss of export markets would have a serious effect throughout the country. Job losses both on farms and in support industries would occur during a prolonged outbreak. A large outbreak in a dairy area would affect the viability of dairy factories and may result in short-term shortages of dairy products.

If rinderpest became endemic, continuing economic loss would occur as a result of losses in young animals and the cost of preventive vaccination. Permanent loss of some markets could be expected. For example, legislation in the United States currently prohibits the importation of beef from countries in which rinderpest is present, and all meat exports to the United States would therefore cease. Other countries could also place a ban on imports, at least in the short term.

It is of prime importance that interference with normal local trade in animals and animal products be restricted to the minimum required to prevent transmission of infection. This minimum must take into consideration any constraints that will apply if a zoning strategy is implemented for international trade purposes. Movement control procedures within the control area (see Section 4) should ensure that, as far as possible, normal local production and distribution of animal and animal products are maintained from 'free' properties.

Movement restrictions within the restricted area and control area (see Section 4) would cause some loss of market opportunities, and associated financial losses to unaffected properties in the area and to support industries such as stock transporters.

Meat and milk supplies in the areas near an outbreak may be restricted for a short period. As the international export of meat is likely to be greatly reduced, at least in the short term, meat would only be directed to the domestic market. Prices are likely to fall. If an area supplying milk to a major population centre is affected, milk shortages and consequent higher prices could be expected if the outbreak is large in scale. In dairying areas, however, the disease is more amenable to eradication than in extensive grazing areas, so large-scale outbreaks are unlikely.

3.3 Critical factors for an Australian response

- Rinderpest is a peracute to acute, usually fatal, viral disease, principally of cattle and buffalo.
- The disease may establish in pigs and susceptible feral ruminants (deer, buffalo, camels, goats).
- Rinderpest is rapidly spread by direct contact and has a short incubation period, so the disease should become apparent soon after introduction in a closely settled area.
- Infection spreads to new areas by the movement of infected animals.
- Tests are available for rapid detection. Diagnosis of acute cases should be relatively simple, but diagnosing subacute (mild) cases may be more difficult, including in species other than cattle.
- Recovered animals show solid immunity, and there is no known chronic carrier state in recovered animals.
- The virus survives for only a short time in the environment and is rapidly inactivated by disinfectants.
- A safe, reliable vaccine is available, but distinguishing vaccinated from field-infected animals is difficult.
- There are no public health implications.
- There is a small likelihood of outbreaks in remote parts of Australia, where stock populations are sparse, before the disease is detected.
- The expected severe market disruption would reduce the value of all related industries.

4 Policy and rationale

4.1 Introduction

Rinderpest is a World Organisation for Animal Health (OI)–listed disease that has the potential for rapid spread within herds and serious production losses, and is of major importance in the trade of cattle and cattle products.

4.1.1 Summary of policy

The policy with regard to an outbreak of rinderpest is to eradicate the disease in the shortest possible time using *stamping out*, supported by a combination of strategies, including:

- *early recognition* and laboratory confirmation of cases
- *quarantine and movement controls* over animals, products and other potentially contaminated items in declared areas, to minimise spread of infection
- *disposal* of destroyed animals and animal products likely to be contaminated, to remove the source of infection
- *tracing and surveillance* (based on epidemiological assessment) to determine the source and extent of infection and subsequently to provide proof of freedom from the disease
- *control of all susceptible populations of animals* through assessment and management of the risk posed by species other than cattle, including feral pigs and feral goats
- *decontamination and/or disposal* of fomites (facilities, equipment and other items) to eliminate the pathogen
- *zoning/compartmentalisation* to define infected and disease-free areas and premises, and to assist in regaining market access
- *an awareness campaign* to facilitate cooperation from the industry and the community.

4.1.2 Cost-sharing arrangement

In Australia, rinderpest is included as a Category 2 emergency animal disease in the Government and Livestock Industry Cost Sharing Deed in Respect of Emergency Animal Disease Responses (EAD Response Agreement – EADRA).[10] When cost sharing of the eligible response costs of an incident is agreed, Category 2 diseases are those for which costs will be shared 80% by government and 20% by industry.

4.1.3 Criteria for proof of freedom

According to the OIE *Terrestrial animal health code*, Australia would be considered to be free from rinderpest 3 months after the last case if a stamping-out policy is practised or, if vaccination is carried out, 3 months after the last vaccinated animal is slaughtered or destroyed.

[10] Information about the EAD Response Agreement can be found at www.animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/ead-response-agreement.

Clinical surveillance should be supported by serological testing of the susceptible animal population in the restricted area (RA) and control area (CA) to an appropriate level of confidence to provide sufficient proof that the disease has been eradicated.

If vaccination has to be used, animals would need to be permanently identified and slaughtered commercially when possible. This is necessary because the presence of vaccinal antibodies could mask evidence of transmission or a subsequent outbreak.

As the disease has a short incubation period and does not survive long in the environment, a sentinel animal restocking program would be unnecessary. The farm could be safely restocked 15 days after destruction and disposal of the last clinical case. After restocking, the premises would be quarantined and placed under surveillance.

See Section 7 for further details on proof of freedom.

4.1.4 Governance

Governance arrangements for the response to EADs are outlined in the **AUSVETPLAN *Overview***.

Information on the responsibilities of a state coordination centre and local control centre is available in the **AUSVETPLAN management manual *Control centres management* (Parts 1 and 2)**.

4.2 Public health implications

Rinderpest has no public health implications.

4.3 Control and eradication policy

The policy for an outbreak of rinderpest is to control and eradicate the disease through stamping out and to re-establish the rinderpest-free status of Australia as quickly as possible.

This can best be achieved through the immediate quarantining of infected premises (IPs) and dangerous contact premises (DCPs), imposition of movement controls, and destruction of animals on the quarantined premises to contain and eliminate the main source of virus.

Tracing and surveillance will be required to determine the extent of infection so that adequate areas can be declared for disease control purposes and to assist in establishing proof of freedom.

4.3.1 Epidemiological assessment

Epidemiological investigation or assessment draws on multiple sources of information to build understanding of the disease and how it is behaving in an outbreak. This helps inform response decision making.

The key objectives for an epidemiological assessment will be to identify:

- the spatial distribution of infected and free animal populations
- potential vectors involved, including as potential amplifying hosts
- the source of infection

- the prevalence of infection
- pathways of spread and the likely size of the outbreak
- risk factors for the presence of infection and susceptibility to disease (including weather and insect populations).

Epidemiological assessment, and tracing and surveillance activities (see Section 4.3.3) in an EAD response are interrelated activities. Early findings from tracing and surveillance will be inputs into the initial epidemiological assessment (eg considering spatial distribution of infection). The outcomes of the initial epidemiological assessment will then guide decisions on subsequent tracing and surveillance priorities.

The outcomes of the epidemiological assessment will also be used to guide the selection of other appropriate response measures (including the application of movement controls) and assess the progress of disease control measures.

Ongoing epidemiological assessment is important for any EAD response to aid evaluation of the continued effectiveness and value of response measures. Ongoing epidemiological assessment will consider the outcomes of tracing and surveillance activities, and will contribute evidence to support any later claims of disease freedom.

4.3.2 Quarantine and movement controls

See Section 5 for details on declared premises and areas, and Section 6 for recommended quarantine and movement controls.

Quarantine

Quarantine will be immediately imposed on all premises and areas on which infection is either known or suspected.

Premises will be declared (see Section 5.2). An RA and CA will be declared around the IP (see Section 5.1).

Movement controls

Movement controls are best implemented through the declaration of declared areas and linking permitted movements to each area. As a general principle, the aim of movement controls is to reduce the spread of disease by preventing the movement of infected animals, infected animal products and infected vectors (where relevant for the disease), and by allowing movements that pose a minimal risk.

Section 6.4 provides details on movement controls for live animals, reproductive material (semen and in vivo–derived embryos), animal products and byproducts, waste products and effluent, and other items that might be contaminated.

4.3.3 Tracing and surveillance

Tracing

Detailed tracing of the movement of animals, animal products and feedstuff to and from IPs or DCPs will be urgently carried out.

Trace-back of animals, people and things should extend back for 21 days before the detection of the first clinical case on the initial IP. Trace-forward will need to cover the period from 21 days before the first case to the time quarantine was imposed to enable identification of DCPs and suspect premises (SPs), and to determine the extent of the RA.

Surveillance

Surveillance will be used to assess the extent of infection within the RA and CA, particularly on DCPs and SPs. The surveillance strategy will involve inspection of suspect stock and in-contact animals, examinations of reported illnesses, and serological testing of all susceptible species. Surveillance will also be widely used, in the form of serological testing and animal observation, during the period after the disease is under control and until proof of freedom is obtained.

Surveillance will concentrate on properties considered to be at risk because of recent introduction of animals from IPs, as well as properties in close proximity to IPs. Broad surveillance must be maintained by farmers, veterinarians, stock agents, abattoir workers and others watching for signs of disease and promptly reporting any suspicion of infection.

See Section 7 for further details on surveillance.

4.3.4 Zoning and compartmentalisation for international trade

Where it is not possible to establish and maintain disease freedom for the entire country, establishing and maintaining disease-free subpopulations, through zoning and/or compartmentalisation,[11]may be considered.

In the case of a limited disease outbreak, a containment zone[12] may be established around the areas where the outbreak is occurring, with the purpose of maintaining the disease-free status of the rest of the country outside the containment zone.

All zoning applications would need to be prepared by the Australian Government in conjunction with the relevant jurisdiction(s) and agreed to by the CCEAD. Compartmentalisation applications would require input from the relevant industries. Recognition of both zones and compartments must be negotiated between the Australian Government and individual overseas trading partners. Zoning and compartmentalisation would require considerable resources that could otherwise be used to control an outbreak. Careful consideration will need to be given to prioritising these activities, because the

[11] With zoning, disease-free subpopulations are defined primarily on a geographical basis. With compartmentalisation, disease-free subpopulations are defined primarily by management practices (such as the biosecurity plan and surveillance practices of enterprises or groups of enterprises).

[12] The OIE defines a 'containment zone' as an infected zone within a previously free country or zone, which includes all suspected or confirmed cases that are epidemiologically linked and where movement control, biosecurity and sanitary measures are applied to prevent the spread of, and to eradicate, the infection or infestation. The Australian Government Department of Agriculture and Water Resources commissioned a report on what would be required for the establishment of containment zones in Australia. This report is available at www.ausvet.com.au/tools-resources.

resulting competition for resources could delay the quick eradication of the disease and recognition of disease freedom.

Agreements between trading partners take time to develop, consider and finalise, because of the need to provide detailed information on activities such as biosecurity, surveillance, traceability and diagnostics to support the approach that is developed. An importing country will need assurance that its animal health status is not compromised if it imports from an established disease-free zone in Australia. Trading partners may not accept a zoning or compartmentalisation proposal, regardless of the information provided. Eradication of disease may be achieved before zoning or compartmentalisation applications are finalised.

General guidelines for zoning and compartmentalisation are in Chapter 4.4 of the OIE *Terrestrial animal health code*.

4.3.5 Vaccination

It is unlikely that vaccination will be used for the control of rinderpest in Australia because the policy of stamping out should be successful. However, if it is decided to use vaccination as part of the overall strategy, vaccination should be introduced as early as possible in the response for best effect and use of vaccine.

Ring vaccination around an outbreak may become necessary if the outbreak is not being easily controlled by stamping out. (See Appendix 2 for details on the use of vaccine.)

Modification of the stamping-out policy may be required if the disease becomes established in extensive grazing areas or in the feral ruminant or pig populations. The principal modification would be the application of vaccination. If available, a marked attenuated vaccine that can be differentiated from field strains of the virus would be used. The current attenuated cell-culture vaccine is safe for all species and breeds, and provides long-term immunity. It is the vaccine of choice for ring vaccination around an outbreak to provide a buffer zone of immune animals until stock within the RA can be either mustered or destroyed. Ring vaccination should aim for the effective vaccination of at least 90% of the surrounding herd in areas where mustering within the ring is a problem. All vaccinated animals will be permanently identified in case a decision is made to slaughter or destroy vaccinated cattle before the declaration of freedom.

4.3.6 Treatment of infected animals

Infected or other susceptible animals will not be treated.

4.3.7 Treatment of animal products and byproducts

Certain products may be removed from premises within the RA or CA, and removed from the RA or CA, subject to permit and treatment.

Milk and milk products from IPs will be destroyed and disposed of as appropriate. Milk and milk products that have left the IP during the 5 days before the first case will be traced and suitably heat treated. Marketing of milk from non-exposed animals on DCPs will be permitted, subject to heat treatment for milk powder, since pasteurisation alone may not inactivate rinderpest virus.

Because meat is not infectious for humans, animals from free premises within the RA and CA, and animals not showing clinical signs on IPs and DCPs may move direct to slaughter for local

consumption. To prevent infection of pigs by ingestion of infected beef, the carcases must not be chilled quickly but must be hung to ensure that the normal decrease in pH can occur to a level that will destroy the rinderpest virus; additional precautions may need to be taken with pig carcases because the pH fall is less. It may also be necessary to prepare processed meats in a manner that will destroy the virus, although such meat is unlikely to be important in the transmission of rinderpest.

Hides, skins and fibre should be disinfected before removal from IPs and DCPs, although they are unlikely to remain infective.

Crops and grains may be removed, provided they are not fed immediately to livestock.

4.3.8 Destruction of animals

Stamping out

Control measures will initially focus on eradicating the disease by stamping out to remove the most dangerous source of the virus. This will be the best use of available resources and will permit return to international trade as early as possible.

As soon as practical after rinderpest has been diagnosed and stock have been valued, all infected and in-contact cattle on the IP will be humanely destroyed.

Since the virus survives for only a few days outside the host, in many cases it will be sufficient to declare only part of a property as an IP or DCP, depending on the separation of animal groups and the management practices in place. In this way, not all animals on a property may need to be destroyed. Care must be taken to examine management practices when deciding which groups may have been exposed to infection. Non-exposed cattle on the property will be placed under quarantine and observed for a period for the presence of clinical disease. Such decisions, if possible, will prevent the unnecessary slaughter of a large number of animals.

The following factors will be considered when making a decision on whether to destroy groups of ruminants and pigs on an IP, based on the likelihood of infection being present in such animals:

- results of transmission tests undertaken by the CSIRO Australian Centre for Disease Preparedness
- the degree of direct contact that may have occurred with infected animals
- whether pigs have ingested infected material
- the risk from other susceptible species in contact populations (eg feral pigs, feral goats)
- the likelihood that the disease will die out anyway if the group is isolated from other animals
- the level of intervention required to control the disease in feral animal populations to avoid reinfection
- resources available.

Significantly exposed cattle on DCPs will also be destroyed. Animals from a DCP or SP that are not viraemic (do not show clinical signs and have a normal temperature) may be slaughtered for human consumption, provided that they can be moved safely to an abattoir in accordance with strict guidelines.

Sheep, goats and European-type pigs on DCPs are unlikely to become infected without simultaneous disease in cattle. They should not be destroyed unless it can be shown that they are excreting the virus, or that spread is occurring in the group.

It will not be necessary to destroy any buildings or materials because the virus survives for only a few days in the environment (see Section 2.4.2).

For the same reason, the use of specific sentinel animals is not warranted. If the premises have been destocked, restocking will be permitted after 15 days. If some susceptible animals are allowed to remain on the premises, they should be tested for antibodies, and restocking should be permitted only if no evidence of infection is detected.

A property will remain in quarantine for 2 months after repopulation, with stock movement allowed only for direct slaughter. During this period, a sample of animals will be inspected weekly for 4 weeks, then fortnightly for another month, for the appearance of clinical signs or positive serology.

4.3.9 Disposal of animals, and animal products and byproducts

Carcasses will be buried, composted or burned, or allowed to decompose if they can be protected from scavengers such as dogs and feral pigs. Feedstuff and bedding that may have been contaminated will also be buried, composted or burned (see the **AUSVETPLAN operational manual *Disposal***).

4.3.10 Decontamination

Although the survival of rinderpest virus in the environment is very limited, decontamination is an important strategy to ensure that the virus is not carried from an IP on contaminated material, people or vehicles. Materials of this type do not play an important role in transmission of the disease, but they are possible sources of infection, and their decontamination will help to prevent the spread of infection.

Decontamination will comprise the general cleaning of cowsheds, dairies and any other building in which infected animals were kept. Faeces and other wastes removed at cleaning will be disposed of appropriately, such as by burying (see the **AUSVETPLAN operational manual *Disposal***). Fomites, including bedding materials, feedstuff, footwear, clothing and stock handling equipment, should be appropriately decontaminated or destroyed. People who have had close contact with infected animals or other material will be appropriately decontaminated before leaving the IP.

The IP should remain destocked of ruminants and pigs for 15 days following the destruction of infected stock.

4.3.11 Wild animal management

If rinderpest escapes into the feral buffalo, cattle, goat, pig or deer population, a policy of search and destruction will be followed. If the terrain makes the eradication of feral animals difficult, the formation of a buffer area around the population, either by depopulating the area or by ring vaccination, will be required to contain the disease until the feral animals can be eradicated.

Relevant wild animal management agencies should be involved. For more details, see the **AUSVETPLAN operational manual *Wild animal response strategy***.

4.3.12 Vector management

Vectors play no role in the transmission of rinderpest.

4.3.13 Public awareness and media

The public needs to be aware:

- of which species are susceptible
- that transmission is predominantly by direct contact with infected animals or their secretions
- that disease spread is predominantly via animal movement
- that there are no human health implications.

4.3.14 Other strategies

Because of the high mortality, short incubation period and restriction of spread mainly to direct contact, it is unlikely that an outbreak of rinderpest would not be eradicated. If the size of an outbreak outstripped the resources available for control, and ring vaccination was not able to contain the disease, rinderpest would have to be considered endemic.

Endemic rinderpest, which is only likely to occur in extensive or remote areas, will be controlled by vaccination of all cattle in areas where the disease occurs, using an attenuated cell culture vaccine of an appropriate level of attenuation for the breed in which it is to be used. Initially, all stock would be vaccinated, but, in subsequent years, only young and introduced stock not previously vaccinated would require vaccination. Vaccination of the entire susceptible population should result in the field virus dying out, allowing the discontinuation of vaccination after only a couple of years.

The OIE *Terrestrial animal health code* describes the requirements that must be met to obtain official OIE recognition of country freedom from this disease (Article 8.16.6).

4.4 Funding and compensation

Details of the cost-sharing arrangements can be found in the Government and Livestock Industry Cost Sharing Deed in Respect of Emergency Animal Disease Responses.[13] Details of the approach to the valuation of, and compensation for, livestock and property in disease responses can be found in the **AUSVETPLAN operational manual *Valuation and compensation***.

[13] www.animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/ead-response-agreement

5 Guidelines for classifying declared areas and premises

When an emergency animal disease (EAD) incident is first suspected, the premises involved would undergo a clinical and/or epidemiological investigation. If the case definition, as defined in the relevant AUSVETPLAN response strategy, is met (ie the index case[14]), the relevant chief veterinary officer (CVO) or their delegate will determine the premises classification and may declare the premises an infected premises (IP).

After the identification of the first IP, a restricted area (RA) and a control area (CA) may be declared.[15] A transmission area (TA) may also be defined, if appropriate. All premises within these areas will be classified. At the beginning of an EAD incident, the initial premises classifications would be IP, at-risk premises (ARP), premises of relevance (POR), unknown status premises (UP) and zero susceptible species premises (ZP).

Any premises within the RA or CA will have only one classification at any one time. After an epidemiological investigation, clinical assessment, risk assessment or completion of control measures, a premises may be reclassified.

Once the first IP has been identified, intelligence gathering through veterinary epidemiological investigations would quickly lead to the identification of suspect premises (SPs) and trace premises (TPs). These would be high priorities for follow-up investigation by the relevant state or territory authorities. In a worst-case scenario, an SP could become an IP; therefore, SPs need to be investigated as a matter of very high priority. Similarly, investigation and risk assessment of a TP might identify it as an IP, dangerous contact premises (DCP) or dangerous contact processing facility (DCPF). An SP and a TP might also be assessed as negative and qualified as SP-AN or TP-AN, and eventually reclassified as an ARP, POR or ZP.

All premises classifications are subject to change as a result of a modification in the case definition(s) or investigation(s) as the incident response proceeds.

Classifications should be applied with information needs of managers in mind. They should assist managers to monitor and report progress. Premises classifications to be used should be agreed early in a response, so that control centre personnel can apply the correct and consistent classifications and definitions from the outset of the investigation and response.

5.1 Declared areas

Maintaining movement restrictions on areas for long periods has important implications for resource management, animal welfare, business continuity, and socioeconomic impacts on producers and regional communities.

During the course of an EAD response, it may become necessary for a CA or RA to be expanded, as additional geographical areas or new foci of infection are identified. Later in the response, as control is achieved, mechanisms for gradually reducing the size of the CA and RA can be introduced.

[14] The first case to come to the attention of investigators

[15] This is invariably the case with highly contagious diseases (eg foot-and-mouth disease, equine/avian/swine influenza, classical swine fever) but may not apply to less contagious diseases (eg Hendra virus, anthrax, Australian bat lyssavirus).

An EAD may involve multiple foci of infection, with several jurisdictions potentially involved. Since disease might be controlled at different rates in different areas, there may be the opportunity to progressively lift restrictions on an area basis. This would involve reclassifying previously declared areas (RAs and CAs), with a staged approach to lifting of movement restrictions. This is a key step in the recovery process and will have positive benefits on the community.

5.1.1 Restricted area (RA)

An RA is a relatively small legally declared area around IPs and DCPs that is subject disease controls, including intense surveillance and movement controls.

An RA will be a relatively small declared area[16] (compared with a CA) drawn with at least 1 km radius around all IPs and DCPs, and including as many SPs, TPs and DCPFs as practicable. Based on risk assessment, the RA is subject to intense surveillance and movement controls. The purpose of the RA is to minimise the spread of the EAD. The RA does not need to be circular but can have an irregular perimeter, provided that the boundary is initially an appropriate distance from the nearest IP, DCP, DCPF, SP or TP. Multiple RAs may exist within one CA.

The boundaries will be modified as new information becomes available, including from an official surveillance program. The actual distance in any one direction will be determined by factors such as terrain, the pattern of livestock movements, livestock concentrations, the weather (including prevailing winds), the distribution and movements of relevant wild (including feral) animals, and known characteristics of the disease agent. In practice, major geographic features and landmarks, such as rivers, mountains, highways and roads, are frequently used to demarcate the boundaries of the RA. Although it would be convenient to declare the RA on the basis of local government areas, this may not be practical, as such areas can be larger than the particular circumstances require.

5.1.2 Control area (CA)

A CA is a legally declared area where the disease controls, including surveillance and movement controls, applied are of lesser intensity than those in an RA (the limits of a CA and the conditions applying to it can be varied during an incident according to need).

A CA is a disease-free buffer between the RA and the outside area (OA). Specific movement controls and surveillance strategies will be applied within the CA to maintain its disease-free status and prevent spread of the disease into the OA.

An additional purpose of the CA is to control movement of susceptible livestock for as long as is necessary to complete tracing and epidemiological studies, to identify risk factors and forward and backward risk(s).

The CA will be a larger declared area around the RA(s) – initially, possibly as large as the state or territory in which the incident occurs – where restrictions will reduce the risk of disease spreading from the RA(s). The CA will have a minimum radius of 10 kilometres, encompassing the RA(s). It may be defined according to geography, climate and the distribution of relevant wild (including feral) animals. The boundary will be adjusted as confidence about the extent and distribution of the incident increases.

[16] As defined under relevant jurisdictional legislation

In general, surveillance and movement controls will be less intense in the CA than in the RA, and disease-susceptible animals and their products may be permitted to move under permit within and out of the area.

5.2 Declared premises

Please also refer to the **AUSVETPLAN guidance document *Declared areas and premises classifications*** for more detail on premises status classifications.

5.2.1 Premises status classifications

Infected premises (IP)

A defined area (which may be all or part of a property) on which animals meeting the case definition are or were present, or the causative agent of the emergency animal disease is present, or there is a reasonable suspicion that either is present, and that the relevant chief veterinary officer or their delegate has declared to be an infected premises.

Suspect premises (SP)

Temporary classification of a premises that contains a susceptible animal(s) not known to have been exposed to the disease agent but showing clinical signs similar to the case definition, and that therefore requires investigation(s).

Trace premises (TP)

Temporary classification of a premises that contains a susceptible animal(s) that tracing indicates may have been exposed to the disease agent, or contains contaminated animal products, wastes or things, and that requires investigation(s).

Dangerous contact premises (DCP)

A premises, apart from an abattoir, knackery or milk processing plant (or other such facility) that, after investigation and based on a risk assessment, is considered to contain a susceptible animal(s) not showing clinical signs, but considered highly likely to contain an infected animal(s) and/or contaminated animal products, wastes or things that present an unacceptable risk to the response if the risk is not addressed, and that therefore requires action to address the risk.

Dangerous contact processing facility (DCPF)

An abattoir, knackery, milk processing plant or other such facility that, based on a risk assessment, appears highly likely to have received infected animals, or contaminated animal products, wastes or things, and that requires action to address the risk.

Approved processing facility (APF)

An abattoir, knackery, milk processing plant or other such facility that maintains increased biosecurity standards. Such a facility could have animals or animal products introduced from lower-risk premises under a permit for processing to an approved standard.

Approved disposal site (ADS)

A premises that has zero susceptible livestock and that has been approved as a disposal site for animal carcasses or potentially contaminated animal products, wastes or things.

At-risk premises (ARP)

A premises in a restricted area that contains a live susceptible animal(s) but is not considered at the time of classification to be an infected premises, dangerous contact premises, dangerous contact processing facility, suspect premises or trace premises.

Premises of relevance (POR)

A premises in a control area that contains a live susceptible animal(s) but is not considered at the time of classification to be an infected premises, dangerous contact premises, dangerous contact processing facility, suspect premises or trace premises.

Resolved premises (RP)

An infected premises, dangerous contact premises or dangerous contact processing facility that has completed the required control measures and is subject to the procedures and restrictions appropriate to the area in which it is located.

Unknown status premises (UP)

A premises within a declared area where the current presence of susceptible animals and/or risk products, wastes or things is unknown.

Zero susceptible species premises (ZP)

A premises that does not contain any susceptible animals or risk products, wastes or things.

5.2.2 Qualifiers

Please also refer to the **AUSVETPLAN guidance document *Declared areas and premises classifications*** for more detail on qualifiers.

Assessed negative (AN)

AN is a qualifier that may be applied to ARPs, PORs, SPs, TPs, DCPs or DCPFs. The qualifier may be applied following surveillance, epidemiological investigation, and/or laboratory assessment/diagnostic testing and indicates that the premises is assessed as negative at the time of classification. SPs, TPs, DCPs or DCPFs, once assessed negative, can progress through the SP-AN, TP-AN, DCP-AN or DCPF-AN status to another status. The animals on such premises are subject to the procedures and movement restrictions appropriate to the declared area (RA or CA) in which the premises is located.

This classification is a description to document progress in the response and in the proof-of-freedom phase. The AN qualifier is a temporary status and only valid at the time it is applied. The time that the AN qualifier remains active will depend on the circumstances and will be decided by the jurisdiction. One day is considered a reasonable guideline. The AN qualifier should also provide a trigger for future surveillance activity to regularly review, and change or confirm, a premises status.

The AN qualifier can also function as a counting tool to provide quantitative evidence of progress, to inform situation reports in control centres during a response. It provides a monitor for very high-priority premises (SPs and TPs) as they undergo investigations and risk assessment, and are reclassified, as well as a measure of surveillance activity overall for ARPs and PORs.

The AN qualifier can be applied in a number of ways, depending on the objectives and processes within control centres. The history of each premises throughout the response is held in the information

system; the application of the AN qualifier is determined by the jurisdiction, the response needs and the specific processes to be followed in a local control centre.

Sentinels on site (SN)

SN is a qualifier that may be applied to IPs and DCPs to indicate that sentinel animals are present on the premises as part of response activities (ie before it can be assessed as an RP).

The qualifier should not be applied to premises that have been resolved and have been allowed to restock (regardless of the stocking density chosen for initial restocking).

Vaccinated (VN)

The VN qualifier can be applied in a number of different ways.

At its most basic level, it can be used to identify premises that contain susceptible animals that have been vaccinated against the EAD in question.

However, depending on the legislation, objectives and processes within a jurisdiction, the VN qualifier may be used to track a range of criteria and parameters. The details would need to be developed and tailored to meet individual needs of jurisdictions and circumstances.

The AN and VN qualifiers may be used together if surveillance, an epidemiological assessment and/or laboratory assessment/diagnostic testing support the premises being assessed as negative, and susceptible animals on the premises have also been vaccinated against the EAD.

5.3 Resolving premises and reclassifying declared areas

Maintaining movement restrictions on areas for long periods has important implications for resource management, animal welfare, business continuity, and socioeconomic impacts on producers and regional communities.

During the course of an EAD response, it may become necessary for a CA or RA to be expanded, as additional geographical areas or new foci of infection are identified. Later in the response, as control is achieved, mechanisms for gradually reducing the size of the CA and RA can be introduced.

An EAD may involve multiple foci of infection, with several jurisdictions potentially involved. Since disease might be controlled at different rates in different areas, there may be the opportunity to progressively lift restrictions on an area basis. This would involve reclassifying previously declared areas (RAs and CAs), with a staged approach to lifting of movement restrictions. This is a key step in the recovery process and will have positive benefits on the community.

5.3.1 Reclassifying declared areas

The lifting of restrictions in declared areas is managed by jurisdictions according to their local legislation, regulations and processes.

The key principles for reclassifying a previously declared area during a response should include the following, noting that not all will be relevant for some diseases:

- The area should be epidemiologically distinct from other declared areas.
- All TPs and SPs have been investigated and reclassified, and all IPs, DCPs and DCPFs in the area have been reclassified as RPs.

- All tracing and surveillance associated with EAD control has been completed satisfactorily, with no evidence or suspicion of infection in the area.
- A minimum period of 'x' days[17] has elapsed since pre-determined disease control activities and risk assessment were completed on the last IP or DCP in the area.
- An approved surveillance program (including the use of sentinel animals, if appropriate) has confirmed no evidence of infection in the RA (see below).
- For vector-borne diseases, vector monitoring and absence of transmission studies indicate that vectors are not active.

Lifting of restrictions is a process managed by the combat CVO under jurisdictional legislation and consistent with the most current agreed Emergency Animal Disease Response Plan. When the appropriate conditions are satisfied, a combat jurisdiction can, in consultation with the Consultative Committee on Emergency Animal Diseases (CCEAD), reduce the size of the RA or lift all restrictions. The previous part of the RA would then become part of the CA. Jurisdictions should be able to present documented evidence that the appropriate conditions have been met.

When an RA is lifted and becomes part of the CA, it will have a lower risk status, and the movement restrictions that apply will be consistent with those applying within the CA. Over time, all of the RAs will be reduced and lifted.

If more than one combat jurisdiction is involved, each will use its own appropriate legal jurisdictional mechanisms to lift the declaration of the RA or CA, coordinating with each other and consulting with the CCEAD to ensure wide communication and coordination.

After a further period of surveillance and monitoring, and provided that the additional surveillance and monitoring find no evidence of infection, a jurisdiction, in consultation with the CCEAD, could lift the CA. This would result in the lifting of all the remaining regulatory controls associated with the response, and a return to business as usual.

[17] The minimum period uses, or is based on, the disease-specific incubation periods defined by the OIE – two incubation periods is a common guideline.

6 Movement controls

6.1 Principles

The principles for the recommended quarantine practices and movement controls are as follows:

- Containment and eradication of rinderpest is the highest priority. Therefore, 'normal business movements' are not allowed.
- Live animals pose the greatest risk of disease spread; therefore, their movements from all premises within the restricted area (RA) and control area (CA) must be strictly controlled.
- The outside area (OA) should remain as 'clean' as possible. Therefore, movement of animals from the RA to the OA is prohibited, and movement of products is generally prohibited. Movement of animals and products from the CA to the OA will also be restricted.
- Trace premises (TP) and suspect premises (SP) are temporary classifications, and every effort should be made to resolve the status of these premises as soon as possible.
- The numbers of susceptible animals within the RA should be minimised. Therefore, movements of animals into the RA will be limited and usually for slaughter only.
- Movement restrictions are more stringent within the RA than within the CA, and will be more stringent in the early stages of the response.
- Movement controls may be varied during a response from those listed here. However, this will involve a variation to the agreed Emergency Animal Disease Response Plan, with endorsement by the Consultative Committee on Emergency Animal Diseases (CCEAD) and the National Management Group (NMG).
- Recommended movement controls apply to any movement off a premises, whether on foot or by vehicle, that involves either public or private land.
- All movement control matrixes and narratives are for guidance.
- Application for a movement permit does not automatically mean that one will be granted.
- In emergency or exceptional circumstances, any proposed movement may be considered by the jurisdictional chief veterinary officer (CVO) on a risk-assessed case-by-case basis.
- Interstate movements will need to meet the import requirements of the receiving jurisdiction.

6.2 Guidelines for issuing permits

In an emergency animal disease (EAD) event, quarantine and movement controls must strike a balance between quick and effective disease control and business continuity. Therefore, it is not appropriate to simply prohibit all movement of animals and products. On the other hand, diligence needs to be applied to minimise the risk of further spread of the disease.

Recommended quarantine and movement controls in each AUSVETPLAN response strategy provide guidance on which movements can be allowed and under what conditions. This is based on an analysis of the disease risks that are presented by a specific movement, of a specific commodity, at a specific time during the EAD response phase. Each disease strategy will indicate whether a proposed movement is:

- allowed (under normal jurisdictional, including interstate, requirements)
- prohibited – except under the conditions of a general, special or emergency permit
- prohibited.

Permits may not be available until the relevant CVO provides approval for movements, and this may not be available in the early stages of a response. When assessing risk for the purposes of issuing a permit, the elements to consider may include:

- sources of risk
    - species of animal
    - type of product
    - presence of disease agent on both the originating and destination premises
    - current vector activity, if relevant
    - organisation and management issues (ie confidence in animal tracing and surveillance, biosecurity)
    - proposed use of the animals or products
    - proposed transport route
    - vaccination status of the animals, if relevant
    - treatment of animals and vehicles to prevent concurrent movement of vectors, if relevant
    - security of transport
    - security and monitoring at the destination
    - environment and natural events
    - community and human behaviour
    - risk of sabotage
    - technology
    - regulations and standards
    - available resources for compliance and enforcement
- areas of impact
    - livestock health (health of affected species, including animal welfare)
    - human health (including work health and safety)
    - trade and economic impacts (including commercial and legal impacts)
    - environmental impacts
    - organisational capacity
    - political impacts
    - reputation and image
- proposed risk treatment measures
    - vaccination
    - processing of product
    - disinfection or other treatment of animals, vehicles and fomites
    - vector control, if relevant
    - security
    - communication.

6.3 Types of permits

Permits are either general or special. They are legal documents that describe the animal(s), commodities or things to be moved, the origin and destination, and the conditions to be met for the movement. Either type of permit may include conditions. Once permit conditions have been agreed from an operational perspective, all permit conditions must be met for every permit. Both general and special permits may be in addition to documents required for routine movements between or within

jurisdictions (eg health certificates, waybills, consignment notes, National Vendor Declarations – NVDs).

General permit

General permits (GPs) are used for lower-risk movements, and create a record of each movement to which they apply. They are granted without the need for direct interaction between the person moving the animal(s), commodity or thing and a government veterinarian or gazetted inspector of stock. The permit may be completed via a webpage or in an approved place (such as a government office or commercial premises). A printed version of the permit must accompany the movement. The permit may impose preconditions and/or restrictions on movements. GPs may not be available until the relevant CVO gives approval for general movements, and this may not be available in the early stages of a response.

Special permit

Special permits (SpPs) are issued by the relevant government veterinarian or gazetted inspector of stock. They are used for higher-risk movements, and therefore require formal application and individual risk assessment. SpPs describe the requirements for movement of an animal (or group of animals), commodity or thing, for which a specific assessment has been conducted by the relevant government veterinarian or gazetted inspector of stock. A printed version of the permit must accompany the movement. The permit may impose preconditions and/or restrictions on movements.

Emergency permit

An emergency permit is an SpP that specifies strict legal requirements for an otherwise high-risk movement of an animal, to enable emergency veterinary treatment to be delivered, to enable animals to be moved for animal welfare reasons, or to enable any other emergency movement under exceptional circumstances. These permits are issued on a case-by-case basis under the authorisation of the relevant CVO.

Other movement requests

Movements not reflected within any of the movement control matrixes or narratives may be considered by the relevant jurisdictional CVO on a risk-assessed case-by-case basis.

6.4 Recommended movement controls

Quarantine and movement controls will play a major role in restricting the spread of rinderpest virus from farm to farm, and in preventing spread between in-contact animals and other animals on infected premises (IPs) and dangerous contact premises (DCPs). Movements of animals and animal products from IPs and DCPs will be prohibited, and movements from SPs will be prohibited while the premises are under observation and surveillance. However, non-exposed animals on IPs, DCPs and SPs may be moved under permit for immediate slaughter.

People, vehicles and equipment likely to be contaminated will need to be decontaminated before leaving IPs, DCPs and SPs.

The declaration of an RA around IPs will assist in preventing spread by restricting movements of potentially contaminated materials that have had direct or indirect contact with the IP. The RA will be of sufficient size to ensure that it includes all IPs, DCPs and processing establishments, and as many of the SPs as possible. Although wild pigs, deer, buffalo, camels and goats are unlikely to be of major significance in the spread of disease, their presence must be considered in the declaration of an RA.

A CA will form a buffer zone of at least 10 km between the infected and free areas, and movement into and out of the area will be controlled. All movement restrictions will remain in force until the disease is under control.

Animals will be prohibited from entering the RA and CA; any such animals would be subject to slaughter and compensation if they became infected or were in contact with infected animals.

Some animal products may be removed from premises within the RA and CA where disease is not present, subject to permit and treatment before release.

Animals for slaughter will need to go direct to an abattoir in the RA or CA (as appropriate). They must not be held in the lairage any longer than the minimum time required for meat hygiene purposes (24 hours).

Milk from the RA will go only to processing. It will be collected only at a time when cattle are not in the area around the dairy, because the air vented from the tanker may be contaminated with virus from milk already collected from a property where the disease is incubating. However, the risk of aerosol spread of rinderpest virus from milk tankers is low, so that removal of cattle from the immediate area only at the time of aerosol production should be sufficient. Milk-fed calves or pigs normally penned near the dairy should be moved out of the immediate vicinity while the RA is in force. Alternatively, HEPA filters should be fitted to milk tanker vents. Refer to the milk handling guidelines in the **Response Strategy** for foot-and-mouth disease for further guidance.

Vehicles carrying susceptible animals will be allowed to pass through the RA or CA as long as they are not off-loaded within the area. If the animals are off-loaded during rest stops, the yards used must be rested for 7 days and water troughs decontaminated before the next consignment.

Declared premises

Table 6.1 shows the movement controls that will apply to IPs and SPs in the event of a rinderpest incident.

Table 6.1 Movement controls for declared premises

Quarantine/movement controls	IPs and DCPs	SPs
Movement out of:		
– cattle and buffalo	Prohibited, except that non-exposed animals may be moved for immediate slaughter under permit	As for IPs/DCPs
– sheep, goats, pigs	Allowed under permit, subject to appropriate decontamination or for slaughter for human consumption	As for IPs/DCPs
– milk	Prohibited from IPs but may be allowed from non-exposed animals on DCPs for processing under permit	Allowed for processing under permit
– hides, skins and fibre	Allowed under permit	No restrictions
– grain and crops	Allowed under permit, subject to condition that it is not to be used for stockfeed	Subject to permit if it is to be used for stockfeed
– meat	Allowed under permit	No restrictions

Quarantine/movement controls	IPs and DCPs	SPs
Movement in and out of:		
– people	Allowed under permit, subject to appropriate decontamination	As for IPs/DCPs
– vehicles and equipment	Allowed under permit, subject to appropriate decontamination	Unrestricted
***Movement in of*:**		
– susceptible animals	Allowed under permit after decontamination	As for IPs/DCPs

DCP = dangerous contact premises; IP = infected premises; SP = suspect premises

Declared areas

Table 6.2 shows the movement controls that will apply to RAs and CAs in the event of a rinderpest incident.

Table 6.2 Movement controls for declared areas

Quarantine/movement control	RA (if declared)	CA (if declared)
Movement out of:		
– susceptible animals[a]	Prohibited; non-exposed animals may be moved under permit for immediate slaughter at an abattoir in the RA or CA	Prohibited while disease is spreading, except that non-exposed animals may be moved for immediate slaughter under permit; allowed under permit once disease is under control
– milk	Milk from infected and in-contact cattle to be destroyed. Milk from non-exposed animals may be processed under permit	No restriction
– people, vehicles and equipment	Allowed, subject to appropriate decontamination	No restriction
Movement within of:		
– susceptible animals	Allowed under permit	As for RA
Movement through of:		
– susceptible animals	Allowed under permit	As for RA
Movement in of:		
– susceptible animals	Allowed under permit for restocking purposes	As for RA
Movement along stock routes, rights of way	Prohibited	May be allowed under permit

Quarantine/movement control	RA (if declared)	CA (if declared)
Ongoing harvesting of game meat	Allowed under permit	As for RA
Risk enterprises:		
– abattoirs	May continue to operate under permit; meat may not be quickly chilled	As for RA
– artificial breeding centres	May continue to operate under permit	As for RA
– dairy factories	May continue to operate under permit; milk from dairy factories must be heat treated	As for RA
– sales/shows	Prohibited if cattle involved	Allowed under permit
– live export holding premises	Allowed under permit	As for RA

CA = control area; RA = restricted area
a 'Susceptible animals' include cattle, pigs, sheep, goats and buffalo.

7 Surveillance and proof of freedom

Following the successful eradication of an outbreak by stamping out, Australia would be able to claim freedom from rinderpest 3 months after the last case if serological surveillance had been applied in accordance with article 8.16.8 of the World Organisation for Animal Health (OIE) *Terrestrial animal health code,* and if all vaccinated animals were slaughtered or destroyed. The time period is 3 months after the slaughter of all vaccinated animals where a stamping-out policy, emergency vaccination and serological surveillance are applied.

Infected premises

On infected premises (IPs) (and dangerous contact premises – DCPs – that have been destocked), restocking will be allowed after 15 days. On IPs where some ruminants or pigs are allowed to remain, serological evidence that no spread is occurring after the slaughter of the infected mob will be required before restocking. Surveillance visits of all restocked premises should be made weekly for 4 weeks, then fortnightly for another month.

Suspect or dangerous contact premises

A suspect premises (SP) or DCP requires daily physical surveillance of cattle for 15 days after the first appearance of clinical signs on the IP, followed by weekly inspections for a further 2 weeks. These premises should be included in later serosurveillance.

Restricted area

On other properties in the restricted area (RA), surveillance visits should be made as soon as possible after detection of the first IP in the RA, and then 1, 2, 3 and 4 weeks later.

At surveillance visits, every group of cattle must be inspected and numbers accounted for. In extensive grazing areas, where the degree of contact between groups of animals in a herd may be low, care must be taken to ensure that all groups of animals are present and healthy. If feral animals are detected, appropriate measures must be taken to destroy them.

Once the disease is confidently contained, all cattle herds within the RA should be serologically sampled to provide a 95% confidence level that the disease is not present at 10% prevalence. Small groups of animals should be kept under close examination. This should take place about 1 month after the last IP has been restocked and repeated 2 months later. Herds giving seropositive results should be further tested for evidence of infection.

Control area

All reports of disease in the control area (CA) will need to be investigated. Random sampling should be carried out about 1 month after the last IP has been restocked and then 2 months later.

Appendix 1

RINDERPEST FACT SHEET

Disease and cause

Rinderpest is caused by rinderpest virus.

Species affected

Cattle and buffalo are highly susceptible, and rinderpest is most frequently seen in these species. Clinical disease in other animals such as sheep and goats is uncommon.

Rinderpest does not affect humans.

Distribution

Rinderpest has been eradicated globally (other than laboratory stocks).

Potential pathways for introduction into Australia

Rinderpest could be introduced to Australia only through accidental or malicious release of rinderpest virus from a laboratory.

Key signs

Key signs are high fever, congested mucous membranes, and death within 2–3 days.

Acute cases are characterised by the sudden onset of a rapidly mounting fever, which reaches 40–42 °C by the second or third day after onset and remains high for the next 3–5 days.

Early in the fever, individual animals may show depression, loss of appetite, congestion of the visible mucous membranes, watery discharges from the eyes and nose, drying of the muzzle, constipation, harshness of the hair coat and, in the case of dairy animals, loss of milk production. None of these symptoms permits a diagnosis of rinderpest.

Spread

Rinderpest is usually transmitted by contact with secretions and excretions from infected animals (particularly nasal discharges).

Persistence of the virus

Rinderpest virus is most stable at pH 7.2–7.9, with a half-life of 3.7 days. The virus is highly susceptible to all disinfectants.

Impacts for Australia

An outbreak of rinderpest in Australia might reasonably be expected to cause very high mortality in infected herds.

Appendix 2

PROCEDURES FOR VACCINATION

If it becomes necessary to vaccinate against rinderpest, the tissue culture rinderpest vaccine (TCRV) will be used. This vaccine is accepted as safe for all breeds and species into which it has been inoculated. It can be cheaply and readily produced in large quantities, is noncontagious and is genetically stable on cattle passage. Small supplies of this vaccine produced at the AFRC Institute for Animal Health, Pirbright, United Kingdom, are present in Australia. It has been tested and approved by the then CSIRO Australian Animal Health Laboratory (AAHL).

In Africa, annual vaccination never exceeded 90% of cattle. In some countries, eradication was achieved with no more than 75% of cattle seropositive.

Variable and often low rates of seroconversion following vaccination have been reported from Africa. Likely causes are:

- a breakdown in the cold chain
- rapid reduction in vaccine effectiveness after reconstitution
- using vaccine beyond its shelf life
- poor-quality vaccines
- interference in calves from colostral antibodies.

Care must be taken in hot, arid areas of Australia to ensure that vaccine is used properly.

The shelf half-life after reconstitution is very short – about 1 hour. Higher titres are obtained by culturing the virus on Vero cells, and the half-life can be extended up to 30 days. Heat-stable clones are also now being used.

All vaccinated animals must be permanently identified for later tracing for destruction/slaughter or serological testing, depending on what is required by international market forces.

Glossary

Disease-specific terms

Mucopurulent	Consisting of mucus and pus.
Peyer's patches	Lymphoid organs in the small intestines.
Zebu (cattle)	Bovine animals (*Bos indicus*) with characteristic large hump over the shoulders. Widely distributed in India, China and eastern Africa, and used for cross-breeding in Australia.

Standard AUSVETPLAN terms

Animal byproducts	Products of animal origin that are not for consumption but are destined for industrial use (eg hides and skins, fur, wool, hair, feathers, hoofs, bones, fertiliser).
Animal Health Committee	A committee whose members are the chief veterinary officers of the Commonwealth, states and territories, along with representatives from the CSIRO Australian Centre for Disease Preparedness (CSIRO-ACDP) and the Australian Government Department of Agriculture, Water and the Environment. There are also observers from Animal Health Australia, Wildlife Health Australia, and the New Zealand Ministry for Primary Industries. The committee provides advice to the National Biosecurity Committee on animal health matters, focusing on technical issues and regulatory policy. *See also* National Biosecurity Committee
Animal products	Meat, meat products and other products of animal origin (eg eggs, milk) for human consumption or for use in animal feedstuff.
Approved disposal site	A premises that has zero susceptible livestock and has been approved as a disposal site for animal carcasses, or potentially contaminated animal products, wastes or things.
Approved processing facility	An abattoir, knackery, milk processing plant or other such facility that maintains increased biosecurity standards. Such a facility could have animals or animal products introduced from lower-risk premises under a permit for processing to an approved standard.
At-risk premises	A premises in a restricted area that contains a live susceptible animal(s) but is not considered at the time of classification to be an infected premises, dangerous contact premises, dangerous contact processing facility, suspect premises or trace premises.
Australian Chief Veterinary Officer	The nominated senior veterinarian in the Australian Government Department of Agriculture, Water and the Environment who manages international animal health commitments and the Australian Government's response to an animal disease outbreak. *See also* Chief veterinary officer

AUSVETPLAN	*Aus*tralian *Vet*erinary Emergency *Plan*. Nationally agreed resources that guide decision making in the response to emergency animal diseases (EADs). It outlines Australia's preferred approach to responding to EADs of national significance, and supports efficient, effective and coherent responses to these diseases.
Carcase	The body of an animal slaughtered for food.
Carcass	The body of an animal that died in the field.
Chief veterinary officer (CVO)	The senior veterinarian of the animal health authority in each jurisdiction (national, state or territory) who has responsibility for animal disease control in that jurisdiction. *See also* Australian Chief Veterinary Officer
Compartmentalisation	The process of defining, implementing and maintaining one or more disease-free establishments under a common biosecurity management system in accordance with OIE guidelines, based on applied biosecurity measures and surveillance, to facilitate disease control and/or trade.
Compensation	The sum of money paid by government to an owner for livestock or property that are destroyed for the purpose of eradication or prevention of the spread of an emergency animal disease, and livestock that have died of the emergency animal disease. *See also* Cost-sharing arrangements, Emergency Animal Disease Response Agreement
Consultative Committee on Emergency Animal Diseases (CCEAD)	The key technical coordinating body for animal health emergencies. Members are state and territory chief veterinary officers, representatives of CSIRO-ACDP and the relevant industries, and the Australian Chief Veterinary Officer as chair.
Control area (CA)	A legally declared area where the disease controls, including surveillance and movement controls, applied are of lesser intensity than those in a restricted area (the limits of a control area and the conditions applying to it can be varied during an incident according to need).
Cost-sharing arrangements	Arrangements agreed between governments (national and state/territory) and livestock industries for sharing the costs of emergency animal disease responses. *See also* Compensation, Emergency Animal Disease Response Agreement
Dangerous contact animal	A susceptible animal that has been designated as being exposed to other infected animals or potentially infectious products following tracing and epidemiological investigation.
Dangerous contact premises (DCP)	A premises, apart from an abattoir, knackery or milk processing plant (or other such facility) that, after investigation and based on a risk assessment, is considered to contain a susceptible animal(s) not showing clinical signs, but considered highly likely to contain an infected animal(s) and/or contaminated animal products, wastes or things that present an unacceptable risk to the response if the risk is not addressed, and that therefore requires action to address the risk.

Dangerous contact processing facility (DCPF)	An abattoir, knackery, milk processing plant or other such facility that, based on a risk assessment, appears highly likely to have received infected animals, or contaminated animal products, wastes or things, and that requires action to address the risk.
Declared area	A defined tract of land that is subjected to disease control restrictions under emergency animal disease legislation. There are two types of declared areas: restricted area and control area.
Decontamination	Includes all stages of cleaning and disinfection.
Depopulation	The removal of a host population from a particular area to control or prevent the spread of disease.
Destroy (animals)	To kill animals humanely.
Disease agent	A general term for a transmissible organism or other factor that causes an infectious disease.
Disease Watch Hotline	24-hour freecall service for reporting suspected incidences of exotic diseases – 1800 675 888.
Disinfectant	A chemical used to destroy disease agents outside a living animal.
Disinfection	The application, after thorough cleansing, of procedures intended to destroy the infectious or parasitic agents of animal diseases, including zoonoses; applies to premises, vehicles and different objects that may have been directly or indirectly contaminated.
Disinsectation	The destruction of insect pests, usually with a chemical agent.
Disposal	Sanitary removal of animal carcasses, animal products, materials and wastes by burial, burning or some other process so as to prevent the spread of disease.
Emergency animal disease	A disease that is (a) exotic to Australia or (b) a variant of an endemic disease or (c) a serious infectious disease of unknown or uncertain cause or (d) a severe outbreak of a known endemic disease, and that is considered to be of national significance with serious social or trade implications. *See also* Endemic animal disease, Exotic animal disease
Emergency Animal Disease Response Agreement	Agreement between the Australian and state/territory governments and livestock industries on the management of emergency animal disease responses. Provisions include participatory decision making, risk management, cost sharing, the use of appropriately trained personnel and existing standards such as AUSVETPLAN. *See also* Compensation, Cost-sharing arrangements
Endemic animal disease	A disease affecting animals (which may include humans) that is known to occur in Australia. *See also* Emergency animal disease, Exotic animal disease
Enterprise	*See* Risk enterprise
Enzyme-linked immunosorbent assay (ELISA)	A serological test designed to detect and measure the presence of antibody or antigen in a sample. The test uses an enzyme reaction with a substrate to produce a colour change when antigen–antibody binding occurs.

Epidemiological investigation	An investigation to identify and qualify the risk factors associated with the disease. *See also* Veterinary investigation
Epidemiology	The study of disease in populations and of factors that determine its occurrence.
Exotic animal disease	A disease affecting animals (which may include humans) that does not normally occur in Australia. *See also* Emergency animal disease, Endemic animal disease
Exotic fauna/feral animals	*See* Wild animals
Fomites	Inanimate objects (eg boots, clothing, equipment, instruments, vehicles, crates, packaging) that can carry an infectious disease agent and may spread the disease through mechanical transmission.
General permit	A legal document that describes the requirements for movement of an animal (or group of animals), commodity or thing, for which permission may be granted without the need for direct interaction between the person moving the animal(s), commodity or thing and a government veterinarian or inspector. The permit may be completed via a webpage or in an approved place (such as a government office or commercial premises). A printed version of the permit must accompany the movement. The permit may impose preconditions and/or restrictions on movements. *See also* Special permit
In-contact animals	Animals that have had close contact with infected animals, such as noninfected animals in the same group as infected animals.
Incubation period	The period that elapses between the introduction of a pathogen into an animal and the first clinical signs of the disease.
Index case	The first case of the disease to be diagnosed in a disease outbreak. *See also* Index property
Index property	The property on which the index case is found. *See also* Index case
Infected premises (IP)	A defined area (which may be all or part of a property) on which animals meeting the case definition are or were present, or the causative agent of the emergency animal disease is present, or there is a reasonable suspicion that either is present, and that the relevant chief veterinary officer or their delegate has declared to be an infected premises.
Local control centre	An emergency operations centre responsible for the command and control of field operations in a defined area.
Monitoring	Routine collection of data for assessing the health status of a population or the level of contamination of a site for remediation purposes. *See also* Surveillance
Movement control	Restrictions placed on the movement of animals, people and other things to prevent the spread of disease.

National Biosecurity Committee	A committee that was formally established under the Intergovernmental Agreement on Biosecurity (IGAB). The IGAB was signed on 13 January 2012, and signatories include all states and territories except Tasmania. The committee provides advice to the Agriculture Senior Officials Committee and the Agriculture Ministers' Forum on national biosecurity issues, and on the IGAB.
National Management Group (NMG)	A group established to approve (or not approve) the invoking of cost sharing under the Emergency Animal Disease Response Agreement. NMG members are the Secretary of the Australian Government Department of Agriculture, Water and the Environment as chair, the chief executive officers of the state and territory government parties, and the president (or analogous officer) of each of the relevant industry parties.
Native wildlife	*See* Wild animals
OIE Terrestrial Code	OIE *Terrestrial animal health code*. Describes standards for safe international trade in animals and animal products. Revised annually and published on the internet at: www.oie.int/international-standard-setting/terrestrial-code/access-online.
OIE Terrestrial Manual	OIE *Manual of diagnostic tests and vaccines for terrestrial animals*. Describes standards for laboratory diagnostic tests, and the production and control of biological products (principally vaccines). The current edition is published on the internet at: www.oie.int/en/standard-setting/terrestrial-manual/access-online.
Operational procedures	Detailed instructions for carrying out specific disease control activities, such as disposal, destruction, decontamination and valuation.
Outside area (OA)	The area of Australia outside the declared (control and restricted) areas.
Owner	Person responsible for a premises (includes an agent of the owner, such as a manager or other controlling officer).
Polymerase chain reaction (PCR)	A method of amplifying and analysing DNA sequences that can be used to detect the presence of viral DNA.
Premises	A tract of land including its buildings, or a separate farm or facility that is maintained by a single set of services and personnel.
Premises of relevance (POR)	A premises in a control area that contains a live susceptible animal(s) but is not considered at the time of classification to be an infected premises, suspect premises, trace premises, dangerous contact premises or dangerous contact processing facility.
Prevalence	The proportion (or percentage) of animals in a particular population affected by a particular disease (or infection or positive antibody titre) at a given point in time.
Proof of freedom	Reaching a point following an outbreak and post-outbreak surveillance when freedom from the disease can be claimed with a reasonable level of statistical confidence.

Quarantine	Legally enforceable requirement that prevents or minimises spread of pests and disease agents by controlling the movement of animals, persons or things.
Resolved premises (RP)	An infected premises, dangerous contact premises or dangerous contact processing facility that has completed the required control measures, and is subject to the procedures and restrictions appropriate to the area in which it is located.
Restricted area (RA)	A relatively small legally declared area around infected premises and dangerous contact premises that is subject to disease controls, including intense surveillance and movement controls.
Risk enterprise	A defined livestock or related enterprise that is potentially a major source of infection for many other premises. Includes intensive piggeries, feedlots, abattoirs, knackeries, saleyards, calf scales, milk factories, tanneries, skin sheds, game meat establishments, cold stores, artificial insemination centres, veterinary laboratories and hospitals, road and rail freight depots, showgrounds, field days, weighbridges and garbage depots.
Sensitivity	The proportion of truly positive units that are correctly identified as positive by a test. *See also* Specificity
Sentinel animal	Animal of known health status that is monitored to detect the presence of a specific disease agent.
Seroconversion	The appearance in the blood serum of antibodies (as determined by a serology test) following vaccination or natural exposure to a disease agent.
Serosurveillance	Surveillance of an animal population by testing serum samples for the presence of antibodies to disease agents.
Serotype	A subgroup of microorganisms identified by the antigens carried (as determined by a serology test).
Serum neutralisation test	A serological test to detect and measure the presence of antibody in a sample. Antibody in serum is serially diluted to detect the highest dilution that neutralises a standard amount of antigen. The neutralising antibody titre is given as the reciprocal of this dilution.
Slaughter	The humane killing of an animal for meat for human consumption.
Special permit	A legal document that describes the requirements for movement of an animal (or group of animals), commodity or thing, for which the person moving the animal(s), commodity or thing must obtain prior written permission from the relevant government veterinarian or inspector. A printed version of the permit must accompany the movement. The permit may impose preconditions and/or restrictions on movements. *See also* General permit
Specificity	The proportion of truly negative units that are correctly identified as negative by a test. *See also* Sensitivity
Stamping out	The strategy of eliminating infection from premises through the destruction of animals in accordance with the particular

	AUSVETPLAN manual, and in a manner that permits appropriate disposal of carcasses and decontamination of the site.
State coordination centre	The emergency operations centre that directs the disease control operations to be undertaken in a state or territory.
Surveillance	A systematic program of investigation designed to establish the presence, extent or absence of a disease, or of infection or contamination with the causative organism. It includes the examination of animals for clinical signs, antibodies or the causative organism.
Susceptible animals	Animals that can be infected with a particular disease.
Suspect animal	An animal that may have been exposed to an emergency disease such that its quarantine and intensive surveillance, but not pre-emptive slaughter, is warranted. or An animal not known to have been exposed to a disease agent but showing clinical signs requiring differential diagnosis.
Suspect premises (SP)	Temporary classification of a premises that contains a susceptible animal(s) not known to have been exposed to the disease agent but showing clinical signs similar to the case definition, and that therefore requires investigation(s).
Swill	Also known as 'prohibited pig feed', means material of mammalian origin, or any substance that has come in contact with this material, but does not include: (i) Milk, milk products or milk by-products either of Australian provenance or legally imported for stockfeed use into Australia. (ii) Material containing flesh, bones, blood, offal or mammal carcases which is treated by an approved process.[1] (iii) A carcass or part of a domestic pig, born and raised on the property on which the pig or pigs that are administered the part are held, that is administered for therapeutic purposes in accordance with the written instructions of a veterinary practitioner. (iv) Material used under an individual and defined-period permit issued by a jurisdiction for the purposes of research or baiting. [1] In terms of (ii), approved processes are: 1. rendering in accordance with the 'Australian Standard for the Hygienic Rendering of Animal Products' 2. under jurisdictional permit, cooking processes subject to compliance verification that ensure that a core temperature of at least 100 °C for a minimum of 30 minutes, or equivalent, has been reached. 3. treatment of cooking oil, which has been used for cooking in Australia, in accordance with the 'National Standard for Recycling of Used Cooking Fats and Oils intended for Animal Feeds' 4. under jurisdictional permit, any other nationally agreed process approved by AHC for which an acceptable risk

	assessment has been undertaken and that is subject to compliance verification. The national definition is a minimum standard. Some jurisdictions have additional conditions for swill feeding that pig producers in those jurisdictions must comply with, over and above the requirements of the national definition.
Swill feeding	Also known as 'feeding prohibited pig feed', it includes: • feeding, or allowing or directing another person to feed, prohibited pig feed to a pig • allowing a pig to have access to prohibited pig feed • the collection and storage or possession of prohibited pig feed on a premises where one or more pigs are kept • supplying to another person prohibited pig feed that the supplier knows is for feeding to any pig. This definition was endorsed by the Agriculture Ministers' Council through AGMIN OOS 04/2014.
Trace premises (TP)	Temporary classification of a premises that contains susceptible animal(s) that tracing indicates may have been exposed to the disease agent, or contains contaminated animal products, wastes or things, and that requires investigation(s).
Tracing	The process of locating animals, people or other items that may be implicated in the spread of disease, so that appropriate action can be taken.
Unknown status premises (UP)	A premises within a declared area where the current presence of susceptible animals and/or risk products, wastes or things is unknown.
Vaccination	Inoculation of individuals with a vaccine to provide active immunity.
Vaccine	A substance used to stimulate immunity against one or several disease-causing agents to provide protection or to reduce the effects of the disease. A vaccine is prepared from the causative agent of a disease, its products or a synthetic substitute, which is treated to act as an antigen without inducing the disease.
– adjuvanted	A vaccine in which one or several disease-causing agents are combined with an adjuvant (a substance that increases the immune response).
– attenuated	A vaccine prepared from infective or 'live' microbes that are less pathogenic but retain their ability to induce protective immunity.
– gene deleted	An attenuated or inactivated vaccine in which genes for non-essential surface glycoproteins have been removed by genetic engineering. This provides a useful immunological marker for the vaccine virus compared with the wild virus.
– inactivated	A vaccine prepared from a virus that has been inactivated ('killed') by chemical or physical treatment.

– recombinant	A vaccine produced from virus that has been genetically engineered to contain only selected genes, including those causing the immunogenic effect.
Vector	A living organism (frequently an arthropod) that transmits an infectious agent from one host to another. A *biological* vector is one in which the infectious agent must develop or multiply before becoming infective to a recipient host. A *mechanical* vector is one that transmits an infectious agent from one host to another but is not essential to the life cycle of the agent.
Veterinary investigation	An investigation of the diagnosis, pathology and epidemiology of the disease. *See also* Epidemiological investigation
Viraemia	The presence of viruses in the blood.
Wild animals	
– native wildlife	Animals that are indigenous to Australia and may be susceptible to emergency animal diseases (eg bats, dingoes, marsupials).
– feral animals	Animals of domestic species that are not confined or under control (eg cats, horses, pigs).
– exotic fauna	Nondomestic animal species that are not indigenous to Australia (eg foxes).
Wool	Sheep wool.
Zero susceptible species premises (ZP)	A premises that does not contain any susceptible animals or risk products, wastes or things.
Zoning	The process of defining, implementing and maintaining a disease-free or infected area in accordance with OIE guidelines, based on geopolitical and/or physical boundaries and surveillance, to facilitate disease control and/or trade.
Zoonosis	A disease of animals that can be transmitted to humans.

Abbreviations

Disease-specific abbreviations

Abbreviation	Full title
GREP	FAO/OIE Global Rinderpest Eradication Programme
PPR	peste des petits ruminants

Standard AUSVETPLAN abbreviations

Abbreviation	Full title
ACDP	Australian Centre for Disease Preparedness
AN	assessed negative
ARP	at-risk premises
AUSVETPLAN	Australian Veterinary Emergency Plan
CA	control area
CCEAD	Consultative Committee on Emergency Animal Diseases
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CVO	chief veterinary officer
DCP	dangerous contact premises
DCPF	dangerous contact processing facility
EAD	emergency animal disease
EADRA	Emergency Animal Disease Response Agreement
EADRP	Emergency Animal Disease Response Plan
EDTA	ethylenediaminetetraacetic acid (anticoagulant for whole blood)
ELISA	enzyme-linked immunosorbent assay
GP	general permit
IETS	International Embryo Technology Society
IP	infected premises
LCC	local control centre
NMG	National Management Group
OA	outside area
OIE	World Organisation for Animal Health

Abbreviation	Full title
PCR	polymerase chain reaction
POR	premises of relevance
RA	restricted area
RP	resolved premises
SCC	state coordination centre
SP	suspect premises
SpP	special permit
TP	trace premises
UP	unknown status premises
ZP	zero susceptible stock premises

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